

I claim:

1. A process for making a magnetostrictive actuator comprising the steps of:

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mixing a magnetostrictive material with a UV curable polymer to form a material mixture;

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placing a first film of said material mixture on a bottom slide;

partially curing said polymer with UV light in an oxygen free environment forming a partially cured layer;

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placing a second film of said UV curable polymer on said partially cured layer and curing said second film, whereby said first and second films form a composite beam.

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2. The process of claim 1 wherein said first and second films are further cured by heat.

3. The process of claim 1 further comprising aligning a portion

of said first layer with a magnetic field prior to curing.

4. The process of claim 1 wherein said UV light is around 364 nm wavelength.

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5. The process of claim 1 further comprising using a plurality of said beams made by said process arranged in a predetermined pattern to make a clamp actuator.

10 6. The process of claim 1 wherein said polymer is DSM 4D6-73.

7. The process of claim 1 wherein said magnetostrictive material is TERFENOL-D.

15 8. A method of forming a magnetostrictive actuator comprising the steps of placing a magnetostrictive material and a cross-linking polymer on a base, aligning said magnetostrictive material in a first direction with a magnetic field, curing at least one region of said polymer, aligning magnetostrictive
20 material in uncured regions of said polymer in a second direction with a magnetic field, curing at least a second region of said polymer, whereby at least two regions of cured polymer

are created with magnetostrictive material aligned in at least two different directions.

9. The method of claim 8 further comprising curing a top layer
5 of polymer on said previously cured polymer, where said previously cured layer of polymer contains magnetostrictive material and said top layer of polymer contains no magnetostrictive material.

10 10. The method of claim 8 wherein said curing is by UV light.

11. The method of claim 10 wherein said UV light has a wavelength of around 364 nm.

15 13. The method of claim 8 wherein said first region of polymer is selected with a mask.

14. A method of producing a magnetostrictive actuator comprising the steps of placing a first polymer layer on a glass slide,
20 said first polymer layer containing a magnetostrictive material, curing at least a portion of said polymer on said slide, placing a second polymer layer on said first polymer layer, curing said

second polymer layer.

15. The method of claim 14 wherein said curing is with a UV light source.

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16. The method of claim 15 wherein said UV light source has a wavelength of around 364 nm.

17. The method of claim 14 further comprising placing a sheet
10 magnet under said glass slide before said curing.

18. The method of claim 14 further comprising placing a second glass slide over said polymer layers during curing.

15 19. The method of claim further comprising making multiple layers of polymer with magnetostrictive material and polymer without magnetostrictive material.

20 20. The method of claim 19 wherein at least two of said layers with magnetostrictive material are aligned in different directions.